

# TRANSMITTAL OF APPEAL BRIEF (Small Entity)

Docket No.  
86655-21

In Re Application Of: **Rene TOUTANT et al.**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/994,017	November 27, 2001	Anthony M. SOL	28291	2616	1111

Inventor: **PROGRAMMABLE INTERCONNECT SYSTEM FOR SCALABLE ROUTER**



## COMMISSIONER FOR PATENTS:

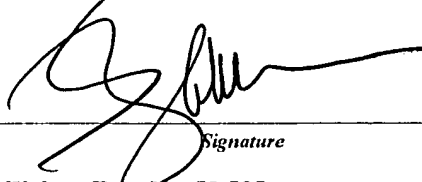
Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed on:  
**November 8, 2006**

☒ Applicant claims small entity status. See 37 CFR 1.27

The fee for filing this Appeal Brief is: **\$250.00**

- ☒ A check in the amount of the fee is enclosed.
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Dated: **February 5, 2007**

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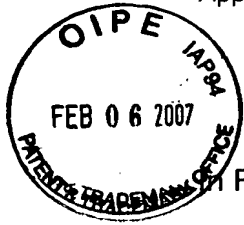
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In Re: U.S. Patent Application of Rene TOUTANT *et al.*

App. No.: 09/994,017 Group Art Unit: 2616

Filed: November 27, 2001 Examiner: Anthony M. SOL

For: **PROGRAMMABLE INTERCONNECT SYSTEM FOR SCALABLE  
ROUTER**

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**APPEAL BRIEF UNDER 37 CFR §41.37**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Further to the Notice of Appeal filed November 8, 2006, submitted herewith is an Appeal Brief in accordance with 37 CFR §41.37. The fee for filing a brief in support of an appeal as set forth in 37 CFR §41.20(b)(2) is also being filed herewith.

A petition for extension of time under 37 CFR 1.136(a) is attached herewith.

If any further fees are due, the Director is hereby authorized to debit the required amount from deposit account no. 19-2550 and to advise the Applicant accordingly.

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**I. 37 CFR §41.37 (c)(1)(i) - Real Party in interest**

The real party in interest is the assignee of the entire interest in the U.S. patent application, namely 4198638 Canada Inc.

**II. 37 CFR §41.37 (c)(1)(ii) - Related Appeals and Interferences**

The Applicant believes that there are no appeals or interferences that are related to, or may directly affect, or be affected by, or have a bearing on the Board's decision in the pending appeal.

**III. 37 CFR §41.37 (c)(1)(iii) - Status of Claims**

The present proceeding relates to claims 1-35, all of which are currently rejected. (The text of these claims can be seen in Section VIII entitled Claims Appendix included below)

The rejection of claims 1-35 is being appealed.

**IV. 37 CFR §41.37 (c)(1)(iv) - Status of Amendments**

A response to the Final Office Action was filed on October 20, 2006. No amendments were intended to be made in the Response. However, due to a typo, the word "switchable" was inserted into independent claim 21. In the "Advisory Action Before the Filing of an Appeal Brief" the Examiner indicated that the amendments were not entered. As such, the claims should be in the same condition as they were prior to receipt of the final Office Action.

The claims as presented herein for appeal are included in section (c)(1)(viii).

**V. 37 CFR §41.37 (c)(1)(v) - Summary of Claimed Subject Matter**

The present application includes 35 claims of which claims 1, 21 and 31 are independent.

**Claim 1**

Claim 1 is directed to a router for directing data packets. The claimed router has a plurality of chassis (100), each having a plurality of processing modules (130) and a programmable interconnection module (140). A data connection exists between each processing module on each chassis and the programmable interconnection module on the same chassis. At least one programmable interconnection module in the claimed router is able to establish switchable connections between individual ones of the processing modules on its chassis, and between at least one processing module on its chassis and an interconnection module on another chassis (See page 14, lines 15-31, and Figures 2 and 3B). As such, when an additional chassis is added to the router, the switchable connections are changed such that at least one processing module on its chassis is connected to an interconnection module on the new chassis. In this manner, an additional chassis can be added to the router (thus making it a scalable router), without having to physically disconnect and re-connect hardware connections between the existing chassis and the new chassis. (See page 16, lines 23-29 and page 18, lines 8-16)

**Claim 21**

Claim 21 is directed towards a chassis (100) for use in building a scalable router. The chassis includes a plurality of processing modules (130), a programmable interconnection module (140) and a data connection between each processing module and the programmable interconnection module. The programmable interconnection module comprises a programmable switch fabric (200, See Fig 2) positioned between electrical input and output ports of the processing modules,

and is operative for creating selectively established connections between individual ones of the ports in accordance with a connection map (See page 18, lines 20-26). The interconnection module is operative for changing the selectively established connections when an additional chassis is added to the scalable router. (see page 16, lines 23-29) The chassis also includes a plurality of optical input and output ports and a plurality of optical-to-electrical conversion units and electrical-to-optical conversion units (see page 13, lines 20-30).

**Claim 31**

Claim 31 relates to a method of upgrading a router that comprises a plurality of original chassis (100), wherein at least one of the original chassis includes an interconnection module (140). The interconnection module establishes switchable connections between the individual ones of the processing modules (130) on its chassis, and between at least one processing module on its chassis and at least one interconnection module on another original chassis. The claimed method includes providing at least one additional chassis (see page 23, line 29), establishing a data connection between an interconnection module on the additional chassis, and at least one interconnection module on at least one of the plurality of original chassis, and re-programming the at least one interconnection module on the at least one original chassis that has switchable connections such that at least one processing module on the original chassis is connected to the interconnection module on the additional chassis (see page 23, line 31 to page 24, line 5).

**VI. 37 CFR §41.37 (c)(1)(vi) - Grounds of rejection to be reviewed on Appeal**

- A. In the Office Action dated July 26, 2005, the Examiner rejected claims 1-3, 6-8, 10-13, 15-17 and 31-35 under 35 U.S.C. §102(e) as being unpatentable over US Patent 6,826,195 (hereafter to be referred to as Nikolich). Regardless of the Applicant's amendments to the claims in the Response dated January 26, 2006, this ground of rejection is repeated in the Final Office Action dated May 8, 2005.
- B. In the Office Action dated July 26, 2005, the Examiner further rejected claims 4 and 5 under 35 U.S.C. §103(a) as being unpatentable over Nikolich in view of U.S. Patent 6,870,813 (hereafter to be referred to as Raza et al.). This ground of rejection is also repeated in the Final Office Action dated May 8, 2005.
- C. In the Office Action dated July 26, 2005, the Examiner further rejected claims 9, 21-23, 26 and 28-30 under 35 U.S.C. §103(a) as being unpatentable over Nikolich in view of U.S. Patent 6,898,205 (hereafter to be referred to as Chaskar). This ground of rejection is also repeated in the Final Office Action dated May 8, 2005.
- D. In the Office Action dated July 26, 2005, the Examiner further rejected claim 27 under 35 U.S.C. §103(a) as being unpatentable over Nikolich in view of Chaskar in still further view of U.S. Patent Publication 2002/0150056 (hereafter to be referred to as Abadi). This ground of rejection is also repeated in the Final Office Action dated May 8, 2005.
- E. In the Office Action dated July 26, 2005, the Examiner further rejected claims 24 and 25 under 35 U.S.C. §103(a) as being unpatentable over

Nikolich in view of Chaskar in further view of Raza. This ground of rejection is also repeated in the Final Office Action dated May 8, 2005.

- F. In the Office Action dated July 26, 2005, the Examiner further rejected claim 14 under 35 U.S.C. §103(a) as being unpatentable over Nikolich in view of Abadi. This ground of rejection is also repeated in the Final Office Action dated May 8, 2005.
- G. In the Office Action dated July 26, 2005, the Examiner further rejected claims 18-20 under 35 U.S.C. §103(a) as being unpatentable over Nikolich in view of U.S. Patent 6,058,116 (hereafter to be referred to as Hiscock). This ground of rejection is also repeated in the Final Office Action dated May 8, 2005.
- H. In the "Advisory Action Before the Filing of an Appeal Brief", the Examiner indicates that the "switchable connections" cannot be found in the specification", and that as such the Examiner had to rely on the rest of the claim language to define "switchable connections". The Examiner further alleges that Nikolich shows in Figs 4 and 19 that the combination of interchassis link port application card 235 (Fig 4) and chassis controller/cluster manager 210 establishes switchable connections between application cards 205 on chassis 200 and between at least one application card 205 and another combination of cards 235 and 210 of another chassis as depicted on Fig 19.

## **VII. 37 CFR §41.37 (c)(1)(vii) - Argument**

### **A. Response to Rejection of claims 1-3, 6-8, 10-13, 15-17 and 31-35 under 35 U.S.C. §102(e)**

As mentioned above in section (c)(1)(vii), the Examiner has rejected claims 1-3, 6-8, 10-13, 15-17 and 31-35 under 35 USC §102(e) as being anticipated by U.S. Patent 6,826,195 (hereafter to be referred to as Nikolich) in both the Office Action dated July 26, 2005 and the final Office Action dated May 8, 2005.

For the reasons presented below, the Applicant respectfully disagrees with the Examiner's rejection, and submits that claims 1-3, 6-8, 10-13, 15-17 and 31-35, as they currently stand, are in allowable form.

#### **Claim 1-3, 6-8, 10-13 and 15-17**

The Examiner's attention is respectfully directed towards the following limitations of independent claim 1:

##### **Claim 1**

A router, comprising:

a plurality of chassis, each chassis comprising a plurality of processing modules and a programmable interconnection module;

a data connection between each processing module on each chassis and the interconnection module on the same chassis; and

a data connection between the interconnection module on each chassis and at least one interconnection module on respective other chassis;

at least one programmable interconnection module being operative for:

- 1) establishing switchable connections between individual processing modules on its chassis and between at least one processing module on its chassis and at least one interconnection module on another chassis;**
- 2) upon addition of an additional chassis to said router, changing said switchable connections such that at least one of said processing modules on its chassis is connected to an interconnection module on said additional chassis.**

As has been previously set forth by the Applicant, Nikolich does not disclose, teach or suggest the above-emphasized limitations of independent claim 1. More specifically, Nikolich does not disclose an interconnection module that is



operative for establishing switchable connections and then “upon addition of an additional chassis...**changing** said switchable connections such that at least one of said processing modules on its chassis is connected to an interconnection module on said additional chassis” [emphasis added]. Not only does Nikolich not teach an interconnection module that is operative to establish switchable connections between individual processing modules on its chassis and between at least one processing module on its chassis and an interconnection module on another chassis, Nikolich also does not teach that the interconnection module changes those switchable connections in response to the addition of another chassis.

Instead, Nikolich teaches a system wherein each chassis has one or more Inter-chassis links (ICL) that switch packets and not the connections between the processing modules on their chassis. Each inter-chassis link is only able to connect to one other inter-chassis link, and is not able to change or switch its connections without being manually re-connected to a different ICL on another chassis. As such, when a chassis is added, none of the ICLs are operative for switching previously established connections so as to be able to connect a processing module on an existing chassis to an ICL on the newly added chassis.

Independent claim 1 clearly recites that the router comprises an interconnection module that is operative for:

“establishing *switchable connections between individual processing modules* on its chassis”

On page 3 of the final Office Action date May 8, 2006, the Examiner asserts that application modules connected to each other through direct point-to-point links via the backplane, as disclosed by Nikolich, are the same as the above claimed switchable interconnections between processing modules. The Applicant respectfully disagrees with the Examiner’s statement, and submits that the direct point-to-point links disclosed by Nikolich are in direct contradiction to the

switchable connections through the programmable interconnect module, as recited in independent claim 1. The application modules within each chassis disclosed by Nikolich are connected to each other through the backplane using a full mesh of continuous (unswitched) direct (not through an ICL) channels, as is clearly stated in column 5, lines 7-11. Given that the connections are continuous, and do not run through an ICL, the Applicant completely disagrees with the Examiner's assertion that point-to-point links disclosed by Nikolich can be considered switchable connections established by an interconnection module.

Independent claim 1 also clearly recites that the programmable interconnection module is operative for "establishing switchable connections...between at least one processing module on its chassis and at least one interconnection module on another chassis". As mentioned above, as opposed to establishing switching connections, the ICLs disclosed by Nikolich *switch packets* (column 5, lines 28-36), using an inter-chassis header. Given that connections do not have headers, it should be apparent that Nikolich discloses switching packets and not connections. In fact, in column 5, lines 10-14, Nikolich himself indicates that *connections* are "continuous direct channels". Nowhere is it disclosed that these continuous direct channels can be switched. Accordingly, Nikolich cannot be said to have ICLs with *switchable* connections between processing modules on its chassis and another interconnection module on another chassis.

Finally, the Applicant respectfully submits that the following limitation is also absent from Nikolich:

upon addition of an additional chassis to said router, [said programmable interconnection module] changing said switchable connections such that at least one of said processing modules on its chassis is connected to an interconnection module on said additional chassis

The Examiner alleges that when an additional chassis is added in the system disclosed by Nikolich, at least one link of the application module 12 becomes the inter-chassis link module connecting at least one application module to an

interchassis link module of the second chassis, and that this is equivalent to the claimed “changing said switchable connections” of independent claim 1. The Applicant firmly disagrees. As stated in column 3, lines 53-56 of Nikolich, the ICL has only one egress port. That one egress port *always* connects all application modules in the ICL’s chassis to at most one other place (i.e. to another chassis, or to nothing if the egress port is not connected to an ICL of another chassis). When an additional chassis is added, that ICL does not switch any of its connections. Instead, the application modules in its chassis are all still connected to that ICL, and that ICL takes them to the same other chassis. In Nikolich, it is a *different* ICL that connects to the new chassis. Nikolich’s ICL does not switch any connections when a new chassis is added.

In Nikolich, the closest thing to switching connections when a chassis is added, is that the system operator (not Nikolich’s ICL) physically connects the a new ICL to the additional chassis. Each inter-chassis link is only able to connect to one other inter-chassis link, and is not able to change or switch its connections without being manually re-connected to a different ICL on another chassis. As such, when a chassis is added, none of the ICLs are operative for switching previously established connections so as to be able to connect to an ICL on the newly added chassis.

In light of the above, the Applicant respectfully submits that Nikolich does not disclose, teach or suggest the above emphasized limitations of independent claim 1.

As per §2131 of the MPEP, in order “to anticipate a claim, the reference must teach every element of the claim”. Since Nikolich does not teach either of the above-emphasized limitations of independent claim 1, Nikolich does not support a rejection based on anticipation. Accordingly, claim 1 meets the requirements of 35 U.S.C. 102. The Applicant therefore submits that claim 1, as it currently

stands, is in allowable form, and respectfully requests that the rejection to independent claim 1 be withdrawn.

Claims 2-3, 6-8, 10-13 and 15-17 depend from independent claim 1 and, as such, incorporate by reference all the limitations contained therein, including the above limitations which have already been shown to be absent from Nikolich. Accordingly, claims 2-3, 6-8, 10-13 and 15-17 are also believed to be in condition for allowance as being dependent upon an allowable base claim. It is thus respectfully requested that the rejection to dependent claims 2-3, 6-8, 10-13 and 15-17 be withdrawn.

Claims 31-35

The Examiner's attention is respectfully directed towards the following limitations of independent claim 31:

A method of upgrading a router including a plurality of original chassis, each original chassis comprising a plurality of processing modules and a programmable interconnection module, wherein a data connection exists between each processing module on each original chassis and the interconnection module on the same original chassis and wherein a data connection exists between the interconnection module on each original chassis and at least one interconnection module on respective other original chassis, **wherein at least one interconnection module on an original chassis establishes switchable connections between the individual processing modules on its chassis and between at least one processing module on its chassis and at least one interconnection module on another original chassis**, the method comprising:

providing at least one additional chassis, each additional chassis comprising a plurality of processing modules and a programmable interconnection module, wherein a data connection exists between each processing module on each additional chassis and the interconnection module on the same additional chassis;

establishing a data connection between an interconnection module on at least one additional chassis and the at least one interconnection module on one of the at least one original chassis;

**re-programming the at least one interconnection module on the at least one original chassis that has the switchable connections, such that at least one processing module on its original chassis is connected to the interconnection module on said at least one additional chassis.**

In rejecting claim 31 in the Final Office Action of May 8, 2006, the Examiner alleges that "the application module 12 of the original chassis can be reprogrammed to switch connections from between processing modules 1-11 to

between a processing module and an interconnection module of the original chassis". Firstly, and for the same reasons as those presented above with respect to independent claim 1, the Applicant respectfully submits that Nikolich does not disclose that an "interconnection module on an original chassis establishes switchable connections between the individual processing modules on its chassis and between at least one processing module on its chassis and at least one interconnection module on another original chassis". Moreover, in Nikolich the application module 12 always has direct point-to-point connections to processing modules 1-11 that are direct, continuous, and are hardwired into the backplane. As such, Nikolich does not teach switchable connections between individual processing modules on a chassis.

Secondly, Nikolich's ICL does not actually switch any connections, what it switches are packets. More specifically, Nikolich does not disclose a method wherein upon the addition of an additional chassis to the router, the method involves "re-programming [an] interconnection module ...such that at least one processing module on its original chassis is connected to the interconnection module on said at least one additional chassis".

As mentioned above with respect to independent claim 1, Nikolich teaches a system wherein each chassis has one or more Inter-chassis links (ICL) that are each only able to connect to one other inter-chassis link, and are operative to switch packets and not the connections between their processing modules and other inter-chassis links. In addition to this, the Applicant respectfully submits that nowhere does Nikolich disclose that the inter-chassis links can be "re-programmed" such that a processing module on the original chassis can be connected to an interconnection module on at least one additional chassis.

Since Nikolich does not teach all the limitations of independent claim 31, Nikolich does not support a rejection based on anticipation. Accordingly, claim 31 meets the requirements of 35 U.S.C. 102. The Applicant therefore submits that claim

31, as it currently stands, is in allowable form, and respectfully requests that the rejection to independent claim 31 be withdrawn.

Claims 32-35 depend from independent claim 31 and, as such, incorporate by reference all the limitations contained therein, including the above-emphasized limitations which have already been shown to be absent from Nikolich. Accordingly, claims 32-35 are now believed to be in condition for allowance as being dependent upon an allowable base claim. It is respectfully requested that the rejection to dependent claims 32-35 be withdrawn.

B. Response to Rejection of claims 4 and 5 under 35 U.S.C. §103(a)

In the final Office Action of May 8, 2006, the Examiner has rejected claims 4 and 5 under 35 USC §103(a) as being unpatentable over Nikolich in view of U.S. Patent 6,870,813 (hereafter to be referred to as Raza)

As per § 2143.03 of the *Manual of Patent Examining Procedure*, in order to establish a *prima facie* case of obviousness, the combined prior art references must teach or suggest all of the claim limitations.

Claims 4 and 5 depend from independent claim 1 and as such incorporate by reference all the limitations contained therein, including the following limitation which has already been shown to be absent from Nikolich. The Applicant further submits that this limitation is also absent from Raza.

**upon addition of an additional chassis to said router, changing said switchable connections such that at least one of said processing modules on its chassis is connected to an interconnection module on said additional chassis.**

Raza relates to service provider networks, and specifically to a transport layer having an optical network. Nowhere does Raza disclose a plurality of chassis in a router, nor interconnection modules for connecting the chassis in the router

together. As such, Raza does not teach the above-emphasized limitation of independent claim 1.

Since neither Nikolich nor Raza teach the above limitation of independent claim 1, and since claims 4 and 5 depend from independent claim 1, the Applicant respectfully submits that the references cited by the Examiner do not support a *prima facie* case of obviousness, as per § 2143.03 of the MPEP. Accordingly, it is respectfully requested that the rejection to claims 4 and 5 under 35 U.S.C. §103(a), be withdrawn.

C. Response to Rejection of claims 9, 21-23, 26 and 28-30 under 35 U.S.C. §103(a)

In the final Office Action dated May 8, 2006, the Examiner has rejected claims 9, 21-23, 26 and 28-30 under 35 USC §103(a) as being unpatentable over Nikolich in view of U.S. Patent 6,898,205 (hereafter to be referred to as Chaskar)

Claim 9

Claim 9 depends from independent claim 1 and as such incorporates by reference all the limitations contained therein, including the following limitation which has already been shown to be absent from Nikolich. The Applicant further submits that this limitation is also absent from Chaskar.

**upon addition of an additional chassis to said router, changing said switchable connections such that at least one of said processing modules on its chassis is connected to an interconnection module on said additional chassis.**

Chaskar relates to a method and system for selecting an offset between data bursts and control packets in an optical burst switching arrangement. Nowhere does Chaskar disclose a router having a plurality of chassis, nor interconnection modules for connecting the chassis in the router together. As such, Chaskar does not disclose the above limitation of independent claim 1.

Accordingly, since neither Nikolich nor Chaskar teach the above limitation of independent claim 1, and since claim 9 depends from independent claim 1, the Applicant respectfully submits that the references cited by the Examiner do not support a *prima facie* case of obviousness, as per § 2143.03 of the MPEP. Accordingly, the Examiner is respectfully requested to withdraw his rejection of claim 9 under 35 U.S.C. §103(a).

Claims 21-23, 26 and 28-30

The Examiner's attention is respectfully directed towards the following limitations of independent claim 21, as amended:

A chassis for use in building a scalable router, comprising:

a plurality of processing modules, each processing module including a plurality of electrical input ports, a plurality of electrical output ports and a processing fabric disposed therebetween;

**a programmable interconnection module, including a plurality of electrical input ports, a plurality of electrical output ports and a programmable switch fabric disposed therebetween, for creating selectively established connections between individual ones of the electrical input ports and corresponding ones of the electrical output ports in accordance with a connection map, said interconnection module being operative for changing said selectively established connections upon the addition of another chassis to the scalable router;**

a data connection between each processing module and the interconnection module, whereby a subset of the plurality of electrical input ports of each processing module on each chassis is connected to a respective subset of the electrical output ports of the interconnection module on that chassis and whereby a subset of the plurality of electrical output ports of each processing module on each chassis is connected to a respective subset of the electrical input ports of the interconnection module on that chassis

a plurality of optical input ports and a plurality of optical output ports, for external connection to one or more other chassis of the router;

a plurality of optical-to-electrical conversion units, each optical-to-electrical conversion unit being connected between a respective one of the optical input ports and a respective subset of the electrical input ports of the interconnection module; and

a plurality of electrical-to-optical conversion units, each electrical-to-optical conversion unit being connected between a respective subset of the electrical output ports of the interconnection module and a respective one of the optical output ports.

The Applicant respectfully submits that neither Nikolich nor Chaskar disclose, teach or suggest the above-emphasized limitation of independent claim 21. More



specifically, neither of the references disclose a programmable interconnection module including a programmable switch fabric for **selectively establishing connections** and then “**changing said selectively established connections** upon the addition of another chassis to the scalable router”.

On page 13 of the Final Office Action, the Examiner alleges that Nikolich discloses a Mesh Communication Chip (MCC) that serves as a programmable switching fabric for creating selectively established connections. The Applicant respectfully submits that the Examiner is not considering the teachings of Nikolich in their entirety. More specifically, the Examiner omits to note that the connections are between the electrical ports, and that the MCC is always connected to all 12 ports of the ICL. As such, it cannot be said that the MCC selectively establishes connections between the ports. As discussed earlier, what it does do is to selectively switch packets arriving from the ports to which it is permanently connected.

Furthermore, Nikolich does not teach that the “interconnection module is operative for changing said selectively established connections upon the addition of another chassis to the scalable router”. Instead, Nikolich requires that any changing of established connections is done manually. It cannot be said that the MCC, or the ICL, is operative for changing selectively established connections.

As such, Nikolich does not disclose, or teach the above-emphasized limitation of independent claim 21.

The Applicant further submits that Chaskar does not disclose this limitation either. Instead, Chaskar discloses a technique for selecting the offset between data bursts and their control packets in an optical burst switching arrangement. Chaskar does not disclose a router having a plurality of chassis, nor interconnection modules located on each chassis for interconnecting the plurality of chassis. As such, Chaskar does not disclose the above emphasized limitation

of "said interconnection module...changing said selectively established connections upon the addition of another chassis to the scalable router".

Since neither of the references cited by the Examiner disclose or teach the above emphasized limitation of independent claim 21, the Applicant respectfully submits that this combination of references is insufficient to establish a prima facie case of obviousness, as per § 2143.03 of the MPEP. Accordingly, claim 21 is believed to be in allowable form, and it is respectfully requested that the rejection to independent claim 21 be withdrawn.

Claims 22-23, 26 and 28-30 depend from independent claim 21 and, as such, incorporate by reference all the limitations contained therein. Accordingly, claims 22-23, 26 and 28-30 are now believed to be in condition for allowance as being dependent upon an allowable base claim. It is respectfully requested that the rejection to dependent claims 22-23, 26 and 28-30 be withdrawn.

D. Response to Rejection of claim 27 under 35 U.S.C. §103(a)

In the Final Office Action of May 8, 2006, the Examiner has rejected claim 27 under 35 USC §103(a) as being unpatentable over Nikolich in view of Chaskar in still further view of U.S. Patent Publication 2002/0150056 (hereafter to be referred to as Abadi).

Claim 27 depends from independent claim 21 and as such incorporates by reference all the limitations contained therein, including the following limitation which has already been shown to be absent from both Nikolich and Chaskar. The Applicant further submits that this limitation is also absent from Abadi.

**a programmable interconnection module, including a plurality of electrical input ports, a plurality of electrical output ports and a programmable switch fabric disposed therebetween, for selectively establishing connections between individual ones of the electrical input ports and corresponding ones of the electrical output ports in accordance with a connection map, said**

**interconnection module being operative for changing said selectively established connections upon the addition of another chassis to the scalable router;**

Abadi relates to a method for avoiding deadlocks in a mesh-connected network. Nowhere does Abadi disclose a plurality of chassis in a router, nor an interconnection module on each chassis for selectively establishing connections between electrical input ports and electrical output ports. Nor does Abadi disclose changing those selectively established connections upon the addition of another chassis to the scalable router. As such, Abadi does not teach the above emphasized limitation of independent claim 21.

Accordingly, since none of Nikolich, Chaskar or Abadi teach the above limitation of independent claim 21, and since claim 27 depends from independent claim 21, the Applicant respectfully submits that the combination of references cited by the Examiner does not support a *prima facie* case of obviousness, as per § 2143.03 of the MPEP. Accordingly, it is respectfully requested that the rejection to claim 27 under 35 U.S.C. §103(a) be withdrawn.

E. Response to Rejection of claims 24 and 25 under 35 U.S.C. §103(a)

In the Final Office Action of May 8, 2006, the Examiner has rejected claims 24 and 25 under 35 USC §103(a) as being unpatentable over Nikolich in view of Chaskar in still further view of Raza.

Claims 24 and 25 depends from independent claim 21 and as such incorporate by reference all the limitations contained therein, including the following limitation which has already been shown to be absent from both Nikolich and Chaskar. The Applicant further submits that this limitation is also absent from Raza.

**a programmable interconnection module, including a plurality of electrical input ports, a plurality of electrical output ports and a programmable switch fabric disposed therebetween, for selectively establishing connections between individual ones of the electrical input ports and corresponding ones**

**of the electrical output ports in accordance with a connection map, said interconnection module being operative for changing said selectively established connections upon the addition of another chassis to the scalable router;**

As described above with respect to dependent claims 4 and 5, Raza discloses service provider networks, and specifically a transport layer having an optical network. Nowhere does Raza disclose a plurality of chassis in a router. Nor does Raza disclose an interconnection module on each chassis for selectively establishing connections between electrical input ports and electrical output ports, and then changing those selectively established connections upon the addition of another chassis to the router. As such, Raza does not teach the above emphasized limitation of independent claim 21.

Since neither Nikolich, Chaskar nor Raza teach the above limitation of independent claim 21, and since claims 24 and 25 depend from independent claim 21, the Applicant respectfully submits that the references cited by the Examiner do not support a *prima facie* case of obviousness, as per § 2143.03 of the MPEP. Accordingly, it is respectfully requested that the rejection to claims 24 and 25 under 35 U.S.C. §103(a), be withdrawn.

F. Response to Rejection of claim 14 under 35 U.S.C. §103(a)

In the Final Office Action of May 8, 2006, the Examiner has rejected claim 14 under 35 USC §103(a) as being unpatentable over Nikolich in view of Abadi.

Claim 14 depends from independent claim 1 and as such incorporates by reference all the limitations contained therein, including the following limitation which has already been shown to be absent from Nikolich. The Applicant further submits that this limitation is also absent from Abadi.

**upon addition of an additional chassis to said router, changing said switchable connections such that at least one of said processing modules on its chassis is connected to an interconnection module on said additional chassis.**

For the same reasons as those presented above with respect to claim 27, the Applicant respectfully re-iterates that Abadi relates to a method of avoiding deadlocks in a mesh-connected network. Abadi does not disclose a plurality of chassis in a router, nor an interconnection module on each chassis for establishing switchable connections between individual processing modules on its chassis, and between processing modules and other interconnection modules on other chassis. As such, Abadi does not disclose the above emphasized limitation of changing those switchable connections upon the addition of another chassis to the router.

Accordingly, since neither Nikolich nor Abadi teach the above limitation of independent claim 1, and since claim 14 depends from independent claim 1, the Applicant respectfully submits that the references cited by the Examiner do not support a prima facie case of obviousness, as per § 2143.03 of the MPEP. Accordingly, it is respectfully requested that the rejection to claim 14 under 35 U.S.C. §103(a), be withdrawn.

G. Response to Rejection of claims 18-20 under 35 U.S.C. §103(a)

In the Final Office Action dated May 8, 2006, the Examiner has rejected claims 18-20 under 35 USC §103(a) as being unpatentable over Nikolich in view of U.S. Patent 6,058,116 (hereafter to be referred to as Hiscock).

Claims 18-20 depend from independent claim 1 and as such incorporate by reference all the limitations contained therein, including the following limitation which has already been shown to be absent from Nikolich. The Applicant further submits that this limitation is also absent from Hiscock.

**upon addition of an additional chassis to said router, changing said switchable connections such that at least one of said processing modules on its chassis is connected to an interconnection module on said additional chassis.**

Hiscock relates to an arrangement of trunk clusters wherein the interconnection method has no single point of failure. Nowhere does Hiscock disclose a router comprising a plurality of chassis, wherein each chassis includes an interconnection module for establishing switchable connections. Nor does Hiscock disclose that these interconnection modules are operative to change the switchable connections upon the addition of an additional chassis.

Accordingly, since neither Nikolich nor Hiscock teach the above limitation of independent claim 1, and since claims 18-20 depend from independent claim 1, the Applicant respectfully submits that the references cited by the Examiner do not support a *prima facie* case of obviousness, as per § 2143.03 of the MPEP. Accordingly, the Examiner is respectfully requested to withdraw his rejection of claims 18-20 under 35 U.S.C. §103(a).

H. Response to the Examiner's Comments in the "Advisory Action Before the Filing of an Appeal Brief"

In the "Advisory Action Before the Filing of an Appeal Brief" the Examiner argues that the phrase "switchable connections" cannot be found in the specification, and that as such, the Examiner had to rely on the rest of the claim language to define "switchable connections".

With regard to the Examiner's statement that the phrase "switchable connections" is not found in the specification, the Applicant respectfully submits the Examiner is not considering the teachings of the specification as a whole. Although the specific term "switchable connections" is not used in the specification, the specification does clearly define what is meant by "switchable connections".

More specifically, referring to page 16, lines 15-29 of the specification, it is clearly indicated that “by changing the content of the connection maps, the controller 250 can change the mutual interconnection of the processor cards 130 within the chassis 100 and also the interconnection defined between the processor cards 130 in the chassis 100 and the external world relative to the chassis, which includes other chassis in a multi-chassis configuration”. As such, it should be apparent from the description that the “switchable connections” include mutual interconnections between processor cards that can be changed in accordance with a connection map, as well as interconnections between processor cards and the external world relative to the chassis that can also be changed in accordance with a connection map.

In light of the above explanation of the type of connections that are changed, as well as the manner in which the connections are changed, the Applicant respectfully submits that the switchable connections, as recited in the claims, are quite different from anything disclosed in Nikolich.

**VIII. 37 CFR §41.37 (c)(1)(viii) - Claim Appendix**

The following is a listing of the claims involved in the present appeal.

1. (Previously presented) A router, comprising:
  - a plurality of chassis, each chassis comprising a plurality of processing modules and a programmable interconnection module;
  - a data connection between each processing module on each chassis and the interconnection module on the same chassis; and
  - a data connection between the interconnection module on each chassis and at least one interconnection module on respective other chassis;
  - at least one programmable interconnection module being operative for:
    - 1) establishing switchable connections between individual processing modules on its chassis and between at least one processing module on its chassis and at least one interconnection module on another chassis;
    - 2) upon addition of an additional chassis to said router, changing said switchable connections such that at least one of said processing modules on its chassis is connected to an interconnection module on said additional chassis.
2. (Original) A router as defined in claim 1, wherein the data connections between the processing modules on each chassis and the interconnection module on the same chassis are electrical and wherein the data connections between the interconnection modules on different chassis are optical.
3. (Original) A router as defined in claim 1,
  - wherein the interconnection module on each chassis includes a plurality of electrical input ports, a plurality of electrical output ports and a programmable switch fabric disposed therebetween, the switch fabric being capable of



selectively establishing connections between individual ones of the electrical input ports and corresponding ones of the electrical output ports in accordance with a connection map respectively associated with said chassis.

4. (Original) A router as defined in claim 3, wherein the interconnection module on each chassis includes a signal conditioning module connected to the switch fabric in said interconnection module.

5. (Original) A router as defined in claim 3, wherein the switch fabric in the interconnection module on each chassis is adapted to provide signal conditioning functionality.

6. (Original) A router as defined in claim 3, wherein each processing module on each chassis includes a plurality of electrical input ports, a plurality of electrical output ports and a processing fabric disposed therebetween.

7. (Original) A router as defined in claim 6, wherein a subset of the plurality of electrical input ports of each processing module on each chassis is connected to a respective subset of the electrical output ports of the interconnection module on that chassis.

8. (Original) A router as defined in claim 7, wherein a subset of the plurality of electrical output ports of each processing module on each chassis is connected to a respective subset of the electrical input ports of the interconnection module on that chassis

9. (Original) A router as claimed in claim 3, each chassis further including:  
a plurality of optical input ports;  
a plurality of optical output ports;  
a plurality of optical-to-electrical conversion units, each optical-to-electrical conversion unit being connected between a respective one of the optical input

ports and a respective subset of the electrical input ports of the interconnection module on said chassis; and

a plurality of electrical-to-optical conversion units, each electrical-to-optical conversion unit being connected between a respective subset of the electrical output ports of the interconnection module on said chassis and a respective one of the optical output ports.

10. (Original) A router as defined in claim 6, each chassis further including:

a plurality of network interface modules for interfacing with an external network, each network interface module being connected to one or more respective electrical input ports and one or more respective output ports of one or more of the processing modules on said chassis.

11. (Original) A router as defined in claim 10, wherein the network interface modules are line cards.

12. (Original) A router as defined in claim 1, wherein the data connections between the processing modules on each chassis and the interconnection module on the same chassis are low-bandwidth connections and wherein the data connections between the interconnection modules on different chassis are high-bandwidth connections.

13. (Original) A router as defined in claim 6, wherein the processing fabric on at least one of the processing modules on at least one of the chassis is adapted to perform packet switching between the electrical input ports and the electrical output ports of said at least one of the processing modules.

14. (Original) A router as defined in claim 3, wherein the programmable switch fabric in the interconnection module on at least one of the chassis implements a fully non-blocking switch.

15. (Original) A router as defined in claim 3, wherein the programmable switch fabric in the interconnection module on at least one of the chassis provides loopback functionality.

16. (Original) A router as defined in claim 3, wherein at least one of the chassis further comprises a controller connected to the interconnection module on that chassis, for providing the respective connection map to the switch fabric.

17. (Original) A router as defined in claim 16, wherein the controller on at least one of the chassis is adapted to be controllable from a location remote to the router.

18. (Original) A router as defined in claim 1,  
wherein the chassis are arranged in two or more clusters;  
wherein each chassis in each cluster includes at least one port reserved for intra-cluster connections with chassis in said cluster and at least one port reserved for inter-cluster connections with chassis in other clusters.

19. (Original) A router as defined in claim 1,  
wherein the chassis are arranged in two or more clusters, each cluster including a chassis interconnection module connected to all the chassis in said cluster;  
wherein connections between chassis of a particular one of the clusters are established through the chassis interconnection module of the particular cluster; and  
wherein connections between each pair of clusters are established through the chassis interconnection modules of the clusters of said pair.

20. (Original) A router as defined in claim 19, wherein the chassis interconnection module of each cluster is adapted to provide programmable

connections between different chassis in said cluster and between the chassis in said cluster and the chassis interconnection modules of other clusters.

21. (Previously presented) A chassis for use in building a scalable router, comprising:

- a plurality of processing modules, each processing module including a plurality of electrical input ports, a plurality of electrical output ports and a processing fabric disposed therebetween;

- a programmable interconnection module, including a plurality of electrical input ports, a plurality of electrical output ports and a programmable switch fabric disposed therebetween, for creating selectively established connections between individual ones of the electrical input ports and corresponding ones of the electrical output ports in accordance with a connection map, said interconnection module being operative for changing said selectively established connections upon addition of an additional chassis to the scalable router;

- a data connection between each processing module and the interconnection module, whereby a subset of the plurality of electrical input ports of each processing module on each chassis is connected to a respective subset of the electrical output ports of the interconnection module on that chassis and whereby a subset of the plurality of electrical output ports of each processing module on each chassis is connected to a respective subset of the electrical input ports of the interconnection module on that chassis

- a plurality of optical input ports and a plurality of optical output ports, for external connection to one or more other chassis of the router;

- a plurality of optical-to-electrical conversion units, each optical-to-electrical conversion unit being connected between a respective one of the optical input ports and a respective subset of the electrical input ports of the interconnection module; and

- a plurality of electrical-to-optical conversion units, each electrical-to-optical conversion unit being connected between a respective subset of the electrical

output ports of the interconnection module and a respective one of the optical output ports.

22. (Original) A chassis as defined in claim 21, further comprising:  
a plurality of network interface modules for interfacing with an external network, each network interface module being connected to one or more respective electrical input ports and one or more respective output ports of one or more of said processing modules.

23 (Original) A chassis as defined in claim 22, wherein the network interface modules are line cards.

24. (Original) A chassis as defined in claim 21, wherein said interconnection module includes a signal conditioning module peripheral to said switch fabric.

25. (Original) A chassis as defined in claim 21, wherein said switch fabric is adapted to provide signal conditioning functionality.

26. (Original) A chassis as defined in claim 21, wherein the processing fabric on at least one of said processing modules is adapted to perform packet switching between the electrical input ports and the electrical output ports of said at least one of the processing modules.

27. (Original) A chassis as defined in claim 21, wherein said programmable switch fabric implements a fully non-blocking switch.

28. (Original) A chassis as defined in claim 21, wherein said programmable switch fabric provides loopback functionality.

29. (Original) A chassis as defined in claim 21, further comprising a controller connected to said interconnection module, for providing said connection map to said switch fabric.

30. (Original) A chassis as defined in claim 21, wherein said controller is adapted to be controllable from a location remote to the chassis.

31. (Previously presented) A method of upgrading a router including a plurality of original chassis, each original chassis comprising a plurality of processing modules and a programmable interconnection module, wherein a data connection exists between each processing module on each original chassis and the interconnection module on the same original chassis and wherein a data connection exists between the interconnection module on each original chassis and at least one interconnection module on respective other original chassis, wherein at least one interconnection module on an original chassis establishes switchable connections between the individual processing modules on its chassis and between at least one processing module on its chassis and at least one interconnection module on another original chassis, the method comprising:

providing at least one additional chassis, each additional chassis comprising a plurality of processing modules and a programmable interconnection module, wherein a data connection exists between each processing module on each additional chassis and the interconnection module on the same additional chassis;

establishing a data connection between an interconnection module on at least one additional chassis and the at least one interconnection module on one of the at least one original chassis;

re-programming the at least one interconnection module on the at least one original chassis that has the switchable connections, such that at least one processing module on its original chassis is connected to the interconnection module on said at least one additional chassis.

32. (Original) A method as defined in claim 31, further comprising:  
programming the interconnection modules of each additional chassis prior to the step of providing the at least one additional chassis.
33. (Original) A method as defined in claim 31, further comprising:  
programming the interconnection modules of each additional chassis after the step of providing the at least one additional chassis.
34. (Original) A method as defined in claim 31, wherein establishing a data connection between the interconnection module on each additional chassis and the interconnection module on at least one original chassis includes establishing an electrical connection.
35. (Previously presented) A method as defined in claim 31, further comprising establishing a data connection between the interconnection module on each additional chassis and the interconnection module on at least one other additional chassis, wherein establishing a data connection between the interconnection module on each additional chassis and the interconnection module on at least one other additional chassis includes establishing an optical connection.

**IX. 37 CFR §41.37 (c)(1)(ix) - Evidence Appendix**

There is no evidence submitted herewith.



**X. 37 CFR §41.37 (c)(1)(x) - Related Proceedings Appendix**


There are no related proceedings at per paragraph c(1)(ii) indicated above.

**CONCLUSION**

It is respectfully submitted that claims 1-35 are in condition for allowance as they currently stand. Reconsideration of the rejections and objections is requested. Allowance of claims 1-36 at an early date is solicited.

Respectfully submitted,

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